

James Acker :

Speaking of that - Amita Mehta will finish this afternoon speaking about extreme rainfall events

Are you ready to go, Amita?

One thing about these virtual meetings is that you can't tell for sure if the next speaker is in the room

Amita and Ana are both here at GSFC and up the road at UMBC. Over to you, Amita.

Amita Mehta :

Can you see the slides?!

James Acker :

Just a moment

OK, we're ready to go.

Amita Mehta :

First of all, we remember Greg Leptoukh -- both Ana Prados and I worked with him at one point.

We use Giovanni for various applications -- very useful in data exploration and preliminary analysis for research, teaching university students, and training end-users who may want use NASA water products for water resource management and planning

Here are some examples of how we use Giovanni to demonstrate various weather and climate phenomena to students --

AIRS SST anomalies -- time series and maps -- show El Nino and La Nina events of 2009 and 2010.

Hurricane Irene – MEARR products showing sea level pressure, precipitable water, zonal and meridional winds showing cyclonic winds

Rainfall from Hurricane Irene

We use Giovanni to give hands-on training to a variety of end-users – from state, federal, NGOs, tribal institutions-- often with little background in remote sensing or data products – although they use in situ surface/atmospheric data in their applications

We conduct Applied Remote Sensing Training Program (see the web-site) to connect to end-users

Heavy rain and floods are always of interest

This is relevant because IPCC also projects that extreme rain events would increase!

There is no single definition of ‘extreme rain event’

Extremes’ can vary regionally, for example the heaviest - for example over the US Great Plains, top 10% of heaviest rain event frequency shows large regional and inter-annual variations.

For flash floods, intense rain over a short period is important, moderate but longer duration rain results in flooding as well.

Remaining slides of this presentation show two case studies of how we use Giovanni to depict flood-inducing rain events

The first case is of a rain event over Oklahoma that occurred on 20th June 2007.
This event flooded Oklahoma City, and was one of the largest recorded rainfall of that region.
Accumulated rain exceeded 120 to 150 mm in certain areas

The right panel is actually an animation that is not working here!

This slide shows how clouds changed from 19th to 20th June – this is from AIRS and as you see there was no aqua overpass right over this region on 20th. However, it is easy to figure out that cloud amount increased and cloud-top pressure got dramatically low suggesting increase in deep convective clouds on the 20h

Similarly, low-level meridional jet also intensified over Oklahoma – presumably bring more moisture from the Gulf of Mexico on the 20th

The second case study was conducted over central Colombia, South America.
There was major flooding in the Rio Guaviare and Meta, two of the major tributaries of Orinoco river

James Acker :

An aside: the heavy rain also affected the coffee crop badly!

Amita Mehta :

Monthly rainfall during May 2011 showed quite a regional variation with larger than normal rain over north-eastern Colombia

During May 13-23, 2011 there was substantially large rainfall over north-east Colombia

May 14th was the day with maximum rainfall in this period

There was substantial increase in precipitable water from 13th to 14th of May

Also, cloud cover from AIRS showed large increase

The rainfall showed substantial diurnal fluctuations on 14th May over central Colombia

TRMM rainfall maps show 3-hourly evolution during the 14th.

Maximum rainfall at 0 and 12 UTC

James Acker :

Great use of MERRA wind data

Amita Mehta :

It appears that there was increase convergence over Colombia between 13th and 14th – likely bringing more moisture on the 14th

James Acker :

Thanks Amita - addressing the question at the bottom, G4 is being built partly with handling of L2 data in mind; Chris Lynnes showed how data from individual points on scatter plots and maps will be displayed.

Christopher Lynnes :

AeroStat has Level 2 (pixel) data in it.

Part of what we learned is that it is a bit tricky to do Level 2 data.

Amita Mehta :

Thanks -this is particularly so for rainfall!

James Acker :

Any more closing comments, Amita? Sorry to rush your summary

Amita Mehta : Not really! Thanks.

James Acker :

Great to have your presentation.

Amita Mehta :

Thanks!

James Acker :

OK, that's all for day